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**From:** Moreen, Ed  
**Sent:** Wednesday, June 20, 2018 1:55 PM  
**To:** 'Mark Hartmann'  
**Subject:** RE: FW: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017 (UNCLASSIFIED)

Thanks for the response and offering up some reasonable activities.

Ed

**From:** Mark Hartmann [mailto:mhartmann@bunkerhillmining.com]  
**Sent:** Wednesday, June 20, 2018 1:53 PM  
**To:** Moreen, Ed  
**Cc:** Brian Harden  
**Subject:** Re: FW: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017 (UNCLASSIFIED)

Good afternoon Ed

I don't know why the lead increased. Spenser suggests the mine pool pump had just been changed, but very much doubt the new pump would have impacted the lead numbers. There is nothing in the pump that has anything lead related. The other possibilities would include: 1) Hopper changed the discharge location of the pumped water sometime last year, and the water would have migrated past the shaft load out area (where trains are loaded). There may have been lead rich ore in the ditch from spillage over the years. This is just a guess on my part, and 2) Hopper was trying to work in the Caledonia at some point last fall and perhaps released some water that had been dammed up, but, once again, this is just a guess.

Sorry I couldn't be more help  
Mark Hartmann

On Wed, Jun 20, 2018 at 10:53 AM, Moreen, Ed <[Moreen.Ed@epa.gov](mailto:Moreen.Ed@epa.gov)> wrote:

Brian/Mark:

I don't know if you guys were around the mine last September but if you were I'd be interested to know if you know why the Pb concentrations jumped so dramatically on September 7. It's not easily explained that Pb spiked to an unusually high concentration but other metals did not.

If you have any idea what may have caused that it would be helpful for us to know and document in the annual report we file in the TRI system.

Thanks much,

Ed

-----Original Message-----

From: Archer, Spencer [mailto:[spencer.archer@woodplc.com](mailto:spencer.archer@woodplc.com)]  
Sent: Wednesday, June 20, 2018 9:25 AM  
To: Zion, Rodney E CIV USARMY CENWS (US) <[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)>; Reitter, Eric T

<[eric.reitter@woodplc.com](mailto:eric.reitter@woodplc.com)>

Cc: Moreen, Ed <[Moreen.Ed@epa.gov](mailto:Moreen.Ed@epa.gov)>; Williams, Jacob A CIV USARMY CENWS (US)

<[Jacob.A.Williams@usace.army.mil](mailto:Jacob.A.Williams@usace.army.mil)>; Kunas, Karl J CIV USARMY CENWS (US)

<[Karl.J.Kunas@usace.army.mil](mailto:Karl.J.Kunas@usace.army.mil)>

Subject: RE: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017 (UNCLASSIFIED)

Rod,

Here's additional info.

New mine pool pump was installed and placed into service approximately 17 hours prior to our sampling event on 7 September 2017. At the time of the pump activation the CTP received approximately 2020 gpm of influent. At the time we sampled, the flow had decreased to approximately 1900 gpm. Prior to the new mine pool pump activation the mine discharge flow remained on low flow (gravity flow) for fifteen days.

The lead result is correct and attributed to the suspended solids pumped during the activation of the new mine pool pump that was installed and placed into service approximately 17 hours prior to our sampling event on September 7.

The daily QC reports, sample data and daily log from this time period is attached.

Please let us know if you have any additional questions.

Thanks,

Spencer Thomas Archer, P.E., BCEE

Mobile: +1 805 550 4050

[www.woodplc.com](http://www.woodplc.com)

-----Original Message-----

From: Archer, Spencer

Sent: Wednesday, June 20, 2018 8:53 AM

To: 'Zion, Rodney E CIV USARMY CENWS (US)' <[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)>; Reitter, Eric T

<[eric.reitter@woodplc.com](mailto:eric.reitter@woodplc.com)>

Cc: Moreen, Ed ([moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)) <[moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)>; Williams, Jacob A CIV USARMY CENWS (US) <[Jacob.A.Williams@usace.army.mil](mailto:Jacob.A.Williams@usace.army.mil)>; Kunas, Karl J CIV USARMY CENWS (US)

<[Karl.J.Kunas@usace.army.mil](mailto:Karl.J.Kunas@usace.army.mil)>

Subject: RE: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017 (UNCLASSIFIED)

Rod,

We are digging into this, but wanted to share info ASAP.

As reported during our call on 11 September 2017:

c. New mine pumps seemed to add about 1,400 gpm to gravity flow (750 gpm) starting around September 6.

As reported during our call on 25 September 2017:

b. TSS from the Kellogg Tunnel increased approximately four times normal levels following recent increase in

flows from the mine. Currently only one data point exists.

During the 25 September call, we notified the Government of the 431 mg/L TSS results from the sample collected from the KT on 7 September 2017 as we were concerned with the elevated TSS results. The elevated TSS supports the elevated lead reported which occurred around the same period that the mine installed the new pump and started pumping.

Thanks,

Spencer Thomas Archer, P.E., BCCE  
Mobile: +1 805 550 4050  
[www.woodplc.com](http://www.woodplc.com)

-----Original Message-----

From: Zion, Rodney E CIV USARMY CENWS (US) [mailto:[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)]  
Sent: Tuesday, June 19, 2018 11:17 AM  
To: Archer, Spencer <[spencer.archer@woodplc.com](mailto:spencer.archer@woodplc.com)>; Reitter, Eric T <[eric.reitter@woodplc.com](mailto:eric.reitter@woodplc.com)>  
Cc: Moreen. Ed ([moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)) <[moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)>; Williams, Jacob A CIV USARMY CENWS (US) <[Jacob.A.Williams@usace.army.mil](mailto:Jacob.A.Williams@usace.army.mil)>; Kunas, Karl J CIV USARMY CENWS (US) <[Karl.J.Kunas@usace.army.mil](mailto:Karl.J.Kunas@usace.army.mil)>  
Subject: RE: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017 (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Spencer, I looked over the DMR, and I concur that the lead results for 7 Sept 2017 appear to be either a typo or anomalous. I see a note in the DMR that the influent flow rate on that date decreased from 2020 gpm to 1895 gpm, but that wouldn't explain such a high influent lead concentration on that one single day.

Can you give us some feedback?

Thanks,  
Rod Zion  
U.S. Army Corps of Engineers  
Eastern Environmental Project Office  
Coeur d'Alene, ID  
Office: (208)667-7025 ext 1112  
Cell: (208)691-0948

-----Original Message-----

From: Kunas, Karl J CIV USARMY CENWS (US)  
Sent: Monday, June 18, 2018 8:45 AM  
To: Zion, Rodney E CIV USARMY CENWS (US) <[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)>; Archer, Spencer <[spencer.archer@woodplc.com](mailto:spencer.archer@woodplc.com)>  
Cc: Moreen. Ed ([moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)) <[moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)>; Williams, Jacob A CIV USARMY CENWS (US) <[Jacob.A.Williams@usace.army.mil](mailto:Jacob.A.Williams@usace.army.mil)>  
Subject: RE: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017

Rod, Spencer;

In doing the 2017 TRI, it was noticed that the sample concentration for Pb taken on 7 Sep 2017 seems anomalously high.

DATA VALIDATION REPORT seem to report all data is valid, and it doesn't appear any qualifiers were put on that particular sample/analyte pairing.

Any thoughts?

Karl J. Kunas, P.E., PMP  
Program & Project Manager  
Army Corps of Engineers - Seattle District  
206-764-3448

-----Original Message-----

From: Zion, Rodney E CIV USARMY CENWS (US)  
Sent: Tuesday, October 24, 2017 8:16 AM  
To: Moreen. Ed ([moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)) <[moreen.ed@epa.gov](mailto:moreen.ed@epa.gov)>; Kunas, Karl J CIV USARMY CENWS (US) <[Karl.J.Kunas@usace.army.mil](mailto:Karl.J.Kunas@usace.army.mil)>  
Subject: FW: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017

Ed see attached DMR for September 2017.

Thanks,  
Rod Zion  
U.S. Army Corps of Engineers  
Eastern Environmental Project Office  
Coeur d'Alene, ID  
Office: (208)667-7025 ext 1112  
Cell: (208)691-0948

-----Original Message-----

From: CENWS-NWAO-Submittals  
Sent: Friday, October 20, 2017 2:01 PM  
To: Zion, Rodney E CIV USARMY CENWS (US) <[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)>; Zoeller, Gregory T (Greg) CIV USARMY CENWS (US) <[Gregory.T.Zoeller@usace.army.mil](mailto:Gregory.T.Zoeller@usace.army.mil)>  
Subject: FW: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017

FIO e-submittal for review in RMS 3.0; suspense date 20 October.

Cheryl Sauro  
Engineering Technician  
US Army Corps of Engineers, Seattle District Construction Division (CENWS-CD) Office 253-312-2891 Fax 253-966-4560

-----Original Message-----

From: LaHote, Patricia A [mailto:[patricia.lahote@woodplc.com](mailto:patricia.lahote@woodplc.com)]

Sent: Friday, October 20, 2017 1:54 PM

To: CENWS-NWAO-Submittals <[CENWS-NWAO-Submittal@usace.army.mil](mailto:CENWS-NWAO-Submittal@usace.army.mil)>

Cc: Zion, Rodney E CIV USARMY CENWS (US) <[Rodney.E.Zion@usace.army.mil](mailto:Rodney.E.Zion@usace.army.mil)>; Meyers, Albert <[albert.meyers@woodplc.com](mailto:albert.meyers@woodplc.com)>; Elmer, Patrick <[patrick.elmer@woodplc.com](mailto:patrick.elmer@woodplc.com)>; Projectmail - Bunker Hill CTP\_USACE <[BunkerHill.CTPUSACE@amecfw.com](mailto:BunkerHill.CTPUSACE@amecfw.com)>; Zoeller, Gregory T (Greg) CIV USARMY CENWS (US) <[Gregory.T.Zoeller@usace.army.mil](mailto:Gregory.T.Zoeller@usace.army.mil)>; Reitter, Eric T <[eric.reitter@woodplc.com](mailto:eric.reitter@woodplc.com)>; Lee, Khalfani <[khalfani.lee@woodplc.com](mailto:khalfani.lee@woodplc.com)>; Hope, Patrick <[patrick.hope@woodplc.com](mailto:patrick.hope@woodplc.com)>; Archer, Spencer <[spencer.archer@woodplc.com](mailto:spencer.archer@woodplc.com)>

Subject: [EXTERNAL] RE: W912DW-16-C0012, 01 35 45.00 10-7 DMR September 2017

Mr. Zion,

Please find the attached submittal for 01 35 45.00 10-7 DMR September 2017

This has been submitted thru RMS 3.0 as well. Please let us know if you have any questions.

Thank you.

Patricia LaHote

Technical Professional 3-Field  
Direct: (865) 218-1077

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